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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,693	03/29/2004	Minoru Kadoya	P-6637-US	1219
49443	7590	03/07/2006	EXAMINER	
PEARL COHEN ZEDEK, LLP 1500 BROADWAY 12TH FLOOR NEW YORK, NY 10036			ROGERS, KELLY A	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/810,693	Applicant(s) KADOYA, MINORU	
	Examiner Kelly A. Rogers	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3-29-2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/29/04</u> | 6) <input type="checkbox"/> Other: ____. |

Drawings

1. The drawings are objected to because there are two figures labeled "7a". The second figure should be relabeled "7b". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because in the fourth line the word "ions" is misspelled. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities: on page 5, line 32, the word "damage" should be changed to "damaged". On page 7, line 14, the word "date" should be changed to "state". On page 8, line 24, the word "is" should be added after the words "Figure 7a". On page 8, line 33, the word "is" should be added after the words "Figure 8a".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The final limitation of claim 1 is worded, "said individual laser crystals being each made of a material having a composition expressed by a same chemical formula and having progressive higher concentrations of said rare earth ions toward said output mirror." This claim language is indefinite as to whether or not the inventor intends for the ionic concentration to increase from crystal to crystal or if the inventor intends for the ionic concentration to increase within each individual crystal.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 5 are rejected under 35 U.S.C. 102 (b) as being clearly anticipated by Ludewigt et al. (6,873,633).

As to claim 1, Ludewigt teaches a solid state laser comprising a laser resonator including an output mirror, a laser crystal containing rare earth ions, and at least one reflecting mirror; said output mirror, laser crystal, and reflecting mirror being arranged along an optical axis [see figure 3]. Ludewigt further clarifies that these components are arranged along the same optical axis [column 6, lines 14-16]. Ludewigt teaches a laser diode for emitting pumping light [column 2, lines 60-64] and a pumping optical system for focusing pumping light emitted from said laser diode onto said laser resonator coaxially with said optical axis is inherent due to the need to focus the pumping light upon the resonator [column 2, lines 36-39]. Ludewigt describes that the said laser crystal comprises a plurality of individual laser crystals arranged along said optical axis, said individual laser crystals being each made of a material having a composition expressed by a same chemical formula and having progressive higher concentrations of said rare earth ions toward said output mirror [figures 3 and 4a; column 2, lines 47-53; column 3, lines 64-67; and column 7, lines 54-57].

As to claim 2, Ludewigt teaches said individual laser crystals are disposed of in close mutual contact [figure 3; column 3, lines 34-37].

As to claim 5, Ludewigt teaches the laser crystal being provided with a heat sink on side faces thereof for removal of heat [column 3, lines 44-46].

Thus, Ludewigt reasonably appears to teach all limitations of claims 1, 2, and 5.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludewigt as applied to claim 1 above, and further in view of Hargis et al. (5,751,751).

Ludewigt discloses all the characteristic features of claims 1, 2, and 5 of the present invention as recited above.

Ludewigt fails to disclose the individual laser crystals being integrally bonded to each other. Ludewigt also fails to disclose the individual laser crystals being spaced from each other by a gap substantially smaller than a length of a shortest one of said individual laser crystals.

Hargis discloses the obvious alternative embodiments of the individual laser crystals being integrally bonded to each other [figure 7; column 7, lines 11-13] and the individual crystals being spaced from each other by a gap substantially smaller than a

length of a shortest one of said individual laser crystals [Figure 8; column 7, lines 17-20].

It would have been inherently obvious to one of ordinary skill in the art at the time of invention by applicant to modify the apparatus disclosed by Ludewigt to include the features disclosed by Hargis because these features describe common means for connecting a plurality of laser crystals in a solid state laser apparatus.

One would have been motivated to make these modifications to the apparatus described by Ludewigt in order to establish different connections between crystals for different embodiments as shown by Hargis.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludewigt as applied to claim 1 above, and further in view of Dell'Acqua et al. (2005/0152426).

Ludewigt discloses all the characteristic features of claims 1, 2, and 5 of the present invention as recited above.

Ludewigt fails to disclose the individual laser crystals being made from a material selected from a group consisting of YVO_4 , $\text{Y}_3\text{Al}_5\text{O}_{12}$ (YAG), LiYF_4 (YLF), and GdVO_4 .

Ludewigt also fails to disclose the rare earth ions consisting of neodymium ions.

Dell'Acqua discloses both the rare earth ions as neodymium ions and the individual laser crystals being made from a material selected from a group consisting of YVO_4 , $\text{Y}_3\text{Al}_5\text{O}_{12}$ (YAG), LiYF_4 (YLF), and GdVO_4 [paragraph 14].

It would have been inherently obvious to one of ordinary skill in the art at the time of invention by applicant to modify the apparatus disclosed by Ludewigt to include the

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features disclosed by Dell'Acqua because these features describe common optical gain media means for solid state laser apparatuses.

One would have been motivated to make these modifications to the apparatus described by Ludewigt in order to establish different solid state laser embodiments as shown by Dell'Acqua.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to solid state lasers using a semiconductor pumping light source in general.

U.S. Pat. No. 6,813,306 B2 to Momiuchi et al.

U.S. Pat. No. 5,195,104 to Geiger et al.

U.S. Pat. No. 6,049,558 to Harada et al.

U.S. Pat. No. 6,606,338 B1 to Kraenert et al.

U.S. Pat. No. 6,587,486 B1 to Sepp et al.

U.S. Pat. No. 6,967,766 B2 to Reeder et al.

U.S. Pat. No. 5,701,326 to Flowers

U.S. Pat. No. 5,638,397 to Nighan et al.

U.S. Pat. No. 5,651,020 to Nighan et al.

U.S. Pat. No. 6,504,858 B2 to Cheng et al.

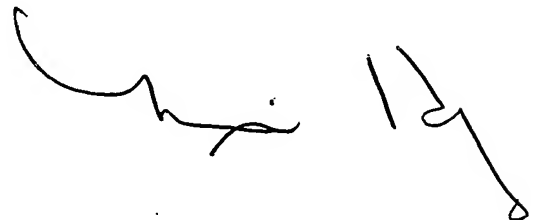
U.S. Pat. No. 6,002,704 to Freitag et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly A. Rogers whose telephone number is 571-272-8047. The examiner can normally be reached on Monday through Friday 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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